Remarks

Claims 1-4, 7-13, 16-19 are now pending in this application. Claims 1-19 are rejected. Claims 5, 6, 14, 15 and 20 have been canceled.

The rejection of Claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Hayford in view of Ansberg (SU 1322138 A) is respectfully traversed.

Hayford describes a nondestructive pulse-echo method that yields a quantitative estimate for developing an "accept or reject" criterion in a quality assurance program. Page 439, first paragraph. Hayford also describes that those specimens with higher values of attenuation generally fail at the lower values of failure loads. Page 441. Hayford suggests that it "might also be possible to develop the technique for monitoring the growth of damage in composites subjected to various load-time histories to a point that would allow prediction of the residual strength of the composite." Page 431, "Conclusions and Significance", first paragraph.

Ansberg describes that a test section of a rail is scanned and *a coefficient of variation* of the amplitude of the detected vibrations is determined on the control section using an electronic calculator. Ansberg also describes that the strength limit of a corroded test rail is then calculated using the obtained *coefficient of variation of the amplitude* of the detected vibrations and a correlation dependency.

Claim 1 recites a method of ultrasound inspection including "providing a composite first aircraft engine part; introducing ultrasound to the first aircraft engine part; receiving at least one reflection of the ultrasound introduced to the first aircraft engine part; and predicting a residual strength of the first aircraft engine part using an amplitude of the received reflection; correlating a plurality of amplitudes of received reflections of a plurality of second aircraft engine parts with at least one non-ultrasound test of each of the second aircraft engine parts; wherein said correlating a plurality of amplitudes comprises generating

a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests."

Neither Hayford nor Ansberg describe or suggest the method recited in Claim 1. Specifically, neither Hayford nor Ansberg describe or suggest a method including generating a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. Rather, as stated in the office action dated July 9, 2003 Hayford does not describe "using an amplitude of the received reflections to predict residual strength of the composite" (page 5), and Ansberg describes "using each of the average failure loads for specimens from region two and three and the average failure load and attenuation for the 14 specimens from regions four through ten, a reasonable straight line fit to the data was obtained. Moreover, Ansberg describes that the "spread in both attenuation data and failure loads is more sensitive to experimental and random errors that to material defects. Any attempt to fit a straight line to such data will give poor correlation. Applicants respectfully submit that Ansberg does not describe using a least squares fit, rather Ansberg describes using an average of the values to produce a straight line, moreover, the straight line produced by Ansberg is a poor correlation of the data. Accordingly, Ansberg does not describe a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. For the reasons set forth above, Claim 1 is submitted to be patentable over Hayford in view of Ansberg.

Claims 5 and 6 are canceled. Claims 2-4 and 7-9 depend from Claim 1. When the recitations of Claims 2-4 and 7-9 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2-4 and 7-9 likewise are patentable over Hayford in view of Ansberg.

Claim 10 recites a ultrasound inspection system including "a pulse echo transducer; a processor operationally coupled to said transducer, said processor configured to predict a residual strength of a first aircraft engine part using an amplitude of a received ultrasound reflection; and a memory containing a correlation of a plurality of amplitudes of received

reflections of a plurality of second aircraft engine parts with at least one non-ultrasound test of each of the second aircraft engine parts, said processor further configured to predict a residual strength of the first aircraft engine part using an amplitude of a received ultrasound reflection and the correlation, said memory further contains a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests.".

Neither Hayford nor Ansberg describe or suggest a ultrasound inspection system recited in Claim 10. Specifically, neither Hayford nor Ansberg describe or suggest a memory containing a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. Rather, as stated in the office action dated July 9, 2003 Hayford does not describe "using an amplitude of the received reflections to predict residual strength of the composite" (page 5), and Ansberg describes "using each of the average failure loads for specimens from region two and three and the average failure load and attenuation for the 14 specimens from regions four through ten, a reasonable straight line fit to the two groups of data was obtained. Moreover, Ansberg describes that the "spread in both attenuation data and failure loads is more sensitive to experimental and random errors that to material defects. Ansberg further recites that any attempt to fit a straight line to such data will give poor correlation. Applicants respectfully submit that Ansberg does not describe using a least squares fit, rather Ansberg describes using an average of the values of two sets of data to produce a straight line, moreover, the straight line produced by Ansberg is a poor correlation of the data. Accordingly, Ansberg does not describe a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. For the reasons set forth above, Claim 10 is submitted to be patentable over Hayford in view of Ansberg.

Claims 14 and 15 are canceled. Claims 11-13 and 16-18 depend from independent Claim 10. When the recitations of Claims 11-13 and 16-18 are considered in combination with the recitations of Claim 10, Applicants submit that dependent Claims 11-13 and 16-18 likewise are patentable over Hayford in view of Ansberg.

Claim 19 recites an ultrasound inspection device that includes "means for non-destructively testing a first aircraft engine part; means for predicting a residual strength of the first aircraft engine part using a result from a non-destructive test of the first aircraft engine part with a plurality of destructive and non-destructive tests on second aircraft engine parts substantially similar to the first part and correlating a plurality of amplitudes of received reflections of a plurality of second aircraft engine parts with at least one non-ultrasound test of each of the second aircraft engine parts by generating a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests."

Neither Hayford nor Ansberg describe or suggest a ultrasound inspection device recited in Claim 19. Specifically, neither Hayford nor Ansberg describe or suggest a means for generating a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. Rather, as stated in the office action dated July 9, 2003 Hayford does not describe "using an amplitude of the received reflections to predict residual strength of the composite" (page 5), and Ansberg describes "using each of the average failure loads for specimens from region two and three and the average failure load and attenuation for the 14 specimens from regions four through ten, a reasonable straight line fit to the two groups of data was obtained. Moreover, Ansberg describes that the "spread in both attenuation data and failure loads is more sensitive to experimental and random errors that to material defects. Ansberg further recites that any attempt to fit a straight line to such data will give poor correlation. Applicants respectfully submit that Ansberg does not describe using a least squares fit, rather Ansberg describes using an average of the values of two sets of data to produce a straight line, moreover, the straight line produced by Ansberg is a poor correlation of the data. Accordingly, Ansberg does not describe a linear least squares fit between the amplitudes and a plurality of results from the non-ultrasound tests. For the reasons set forth above, Claim 19 is submitted to be patentable over Hayford in view of Ansberg.
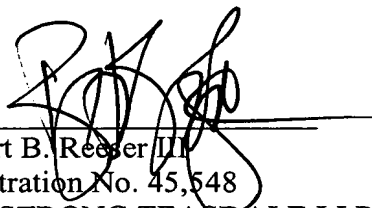
For at least the reasons set forth above, Applicant respectfully requests that the 35 U.S.C. § 103 rejection of Claims 1-19 be withdrawn.

In view of the foregoing remarks, this application is believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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